

Work Order ID 71856 - 2

Wednesday, July 13, 2011 11:00:32 AM



Page 1

Item ID: D2741

Accept



Setup Start



Revision ID:

Stop



Item Name: Blade, 350 Skidtube

Start Date: 7/14/2011 Start Qty: 40.00

Cust Item ID:

Required Date: 7/28/2011 Req'd Qty: 40.00

Customer:

Reference:

Run Start



Approvals: Process Plan: MF

Date: 11-07-13

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr

Revision Nbr

D2741

Rev C

100

0.00



BAND SAW

Bandsaw

Memo

0.00

Jeaspa Bandsaw

Cut blanks 13.850" long +0.063" -0.000"

cut 11/09/12

40 x

110

0.00



HAAS CNC VERTICAL MACHINING #1

HAAS 1

Memo

0.00

HAAS CNC vertical machine #1

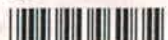
1-Machine per folio FA108

cut 11/09/13

40 x

120

0.00



QC2- Inspect parts off machine FAI/FAIB

QC

Memo

0.00

Quality Control

cut 11/09/13

40 x

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 71856

Wednesday, July 13, 2011 11:00:32 AM



Page 2

Item ID: D2741

Accept



Setup Start



Revision ID:

Stop



Item Name: Blade, 350 Skidtube

Start Date: 7/14/2011 Start Qty: 40.00



Cust Item ID:

Required Date: 7/28/2011 Req'd Qty: 40.00



Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

130



QC

Quality Control

QC8- Inspect parts - second check

0.00

JK 11-09-15

Memo

0.00

140



Small Fab

Small Fab

Small Fab

Memo

1-Deburr 2-Bend per Dwg D2741

0.00

0.00

SB 11/09/19

40

150



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

0.00

S 11/09/19

counts
x40

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 71856

Wednesday, July 13, 2011 11:00:32 AM



Page 3

Item ID: D2741

Accept



Setup Start



Revision ID:

Stop



Item Name: Blade, 350 Skidtube

Start Date: 7/14/2011 Start Qty: 40.00



Cust Item ID:

Required Date: 7/28/2011 Req'd Qty: 40.00



Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

160

Outsource process - Heat Treat

0.00



Outsource1

Memo

0.00

Outsource process - Heat Treat

Issue P/O: 14953 ☐ Harden material as per Dwg D2741 ☐ Min. Ultimate Tensile Strength = 152 ksi (34-40 HRC) ☐ Min. Yield Tensile Strength = 141 ksi ☐ Test report or Certification required

11-09-20

(40)

170

Receive & Inspect for Damage & Mat'l Certs

0.00



Packaging

Memo

0.00

Packaging

Ensure Test report or Certification attached

Per 10/6 (40)

180

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

8/11/2011

conts
+40

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 71856



Page 4

Wednesday, July 13, 2011 11:00:32 AM

Item ID: D2741	Accept		Setup Start	
Revision ID:			Stop	
Item Name: Blade, 350 Skidtube				
Start Date: 7/14/2011	Start Qty: 40.00		Cust Item ID:	
Required Date: 7/28/2011	Req'd Qty: 40.00		Customer:	
Reference:				

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run Start	
	QC:	Date:	SPC (Y/N):	Date:	Stop	

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
190 	Small Fab	0.00							
Small Fab	Memo	0.00							
Small Fab	1-Pass in deburring machine; 2-Grind off edges								
195 	HandFinish	0.00							
Hand Finishing	Memo	0.00							
	clean with wash & wipe to remove oil								
200 	Powdercoat	0.00							
Powder Coating	White Gloss(Ref:4.3.5.2) per QS1005 4.3-Steel	0.00							
	Memo	0.00							
	START TIME: 8:30								
	FINISH TIME: 9:00								

B 11-11-22



~~40X~~ 36X ϕ m-l 11/11/28
36X ϕ

~~40X~~ 36X ϕ m-l 11/11/28
36X ϕ

M118434

4000F

9:00

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 71856

Wednesday, July 13, 2011 11:00:32 AM



Page 5

Item ID: D2741

Accept



Setup Start



Revision ID:

Stop



Item Name: Blade, 350 Skidtube

Start Date: 7/14/2011 Start Qty: 40.00



Cust Item ID:

Required Date: 7/28/2011 Req'd Qty: 40.00



Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

210

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

36 4/4 11-11-28

220

Identify as per dwg & Stock Location

0.00



Packaging

Memo

0.00

Packaging

30 80 11-11-28

230

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

11/11/28

MF 11-11-28

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

Page 1

Wednesday, July 13, 2011 11:00:30 AM

Work Order ID: 71856



Parent Item: D2741



Parent Item Name: Blade, 350 Skidtube

Start Date: 7/14/2011

Required Date: 7/28/2011

Start Qty: 40.00

Required Qty: 40.00

Comments: IPP Rev: D 00.11.15 Removed P/O turning - in house process EC
 IPP Rev: E 06-03-20 As Per Rev C JLM
 IPP Rev: F 06.04.20 Added grinding after heat treating EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
M4130NB0.500X03.000		Purchased	No			100	f	47.2500	1.1541	48.59368			

4130 Bar 0.500 x 3.00

Location	Loc Qty	Loc Code
MAT034	47.25	
117835	47.25	

M118616 x 48.594 * and 11/09/02

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

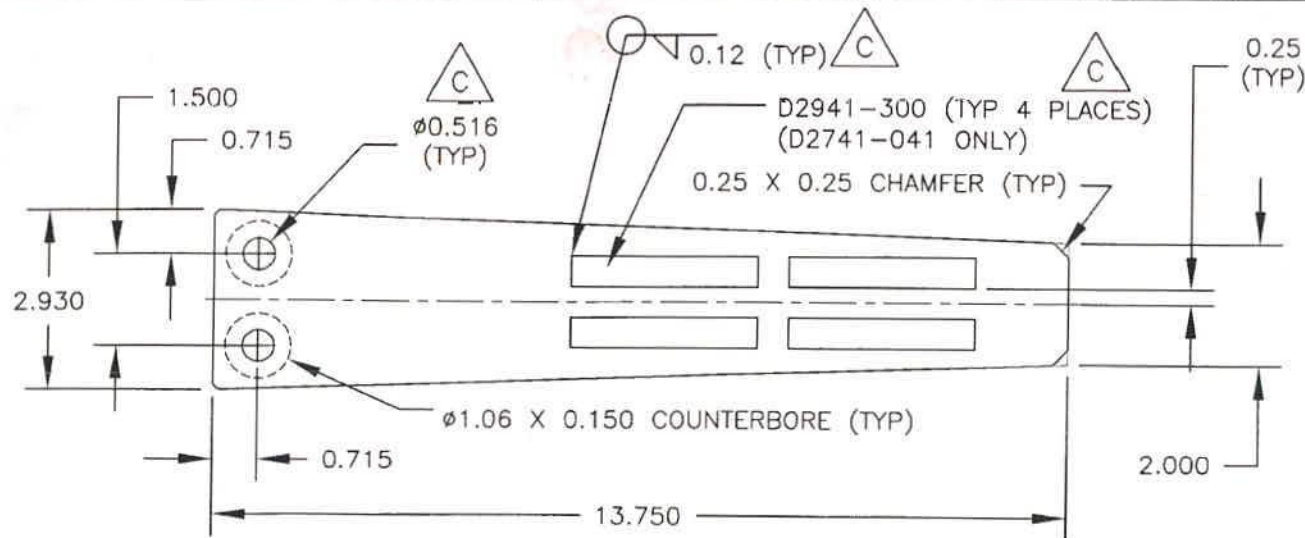
NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

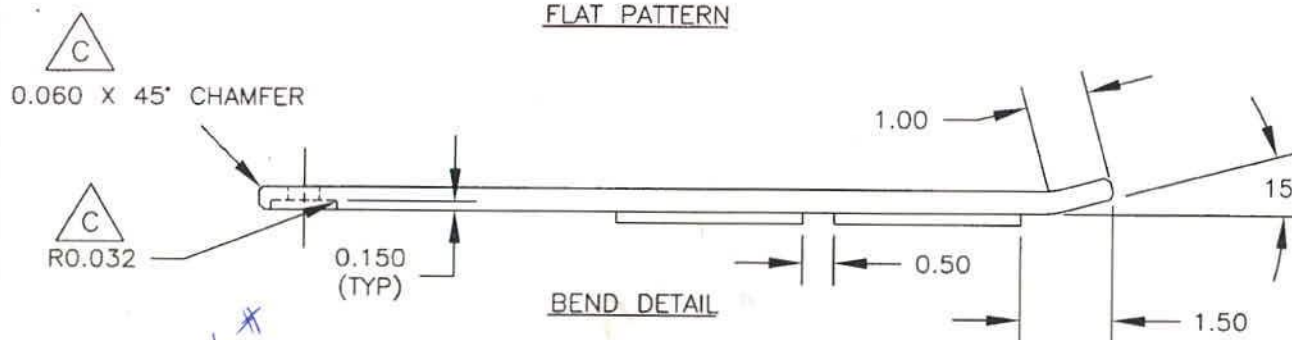
DART

RELEASED
06 02 07

DESIGN	DRAWN BY	DART AEROSPACE USA, INC.
CHKD <i>PH</i>	APPROVED <i>PH</i>	PORT HADLOCK, WA
CHECKED	APPROVED	DRAWING NO.
DATE	06.01.12	D2741
		TITLE
		BLADE
A	98.04.16	NEW ISSUE
B	98.09.01	CHANGE C'SINK TO C'BORE
C	06.01.12	LARGER HOLE, ADD RADIUS AND CHAMFER ADD -041/-043 OPTIONS
		SCALE
		1:3



FLAT PATTERN



BEND DETAIL

D2741 BLADE

- 1) MATERIAL: AISI 4130 STEEL 0.375 THICK
MIN. ULTIMATE TENSILE STRENGTH = 152 ksi (34-40 HRC)
MIN. YIELD TENSILE STRENGTH = 141 ksi
- 2) FINISH: POWDER COAT WHITE (REF. 4.3.5.2) PER DART QSI 005 4.3
- 3) ALL DIMENSIONS ARE IN INCHES
- 4) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 5) BREAK ALL SHARP EDGES 0.030 TO 0.060
- 6) TO MAKE D2741-041, WELD D2941-300 (4) AS SHOWN ABOVE.
REMOVE POWDER COAT FROM SURFACE OF D2941-300
- 7) TO MAKE D2741-043, WELD 7560 HARDCOAT ROD INSTEAD OF D2941-300

Dart Aerospace Ltd

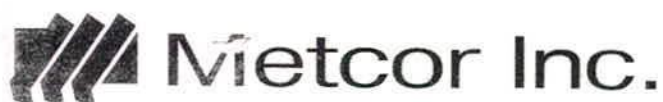
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



Metcor Inc.
560, boul. Arthur-Sauvé
St-Eustache (Québec) J7R 5A8
Tél. : 450-473-1884
Télécopieur / Fax administration : 450-491-5492
Télécopieur / Fax production : 450-491-6454

Certificat de Conformité
Certificate of Compliance
BON DE TRAVAIL / CHARGEMENT
order 168674
load 168674

DEMANDER / customer: DART
1270 ABERDEEN
1001 ABERDEEN
HAMMERSBURG

ON K3A1KT

LIVRÉ À / shipped to:
DART AEROSPACE
1270 ABERDEEN
HAMMERSBURG

ON K3A1KT

COMMANDE DU CLIENT customer no.	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	CODE DE TRAITEMENT matl. heat code	NUMÉRO DE LOT lot number
168674		4180		

SPÉCIFICATIONS DU PROCÉDÉ
processing specifications

SEL. HARDEN
HARDEN AND TEMPER
6-8 HRS 2750K REVUE

EXIGENCE / requirement	SPÉCIFICATIONS / specified	TESTS EXÉCUTÉS / performed	RÉSULTATS DE TESTS / results
40-45 HRC	84-40 HRC	40	88-40 HRC
170-180 KSI	132-132 KSI	<i>Sulphur</i>	171-132 KSI

QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description
40	140	D2741 BLADE REF. 71858 1 PALETTE = 2 BC

COMMENTAIRES / comments

INSPECTEUR / inspector: *[Signature]*

DATE: 2011-10-03



Metcor Inc.
560, boul. Arthur-Sauvé
St-Eustache (Québec) J7R 5A8
Tél. : 450-473-1884
Télécopieur / Fax administration : 450-491-5498
Télécopieur / Fax production : 450-491-6454

Certificat de conformité
Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
169674	1

CLIENT / customer 215
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K8A 1K7

LIVRÉ À / shipped to:
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K8A 1K7

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	CODE DE TRAITEMENT mat'l heat code	NUMÉRO DE LOT lot number
14953		4130		

SPÉCIFICATIONS DU PROCÉDÉ
processing specifications

SEL HARDEN
HARDEN AND TEMPER
SAE AMS 2750/1 REV.E

EXIGENCE / requirement	SPÉCIFICATIONS / specified	TESTS EXÉCUTÉS / performed	RÉSULTATS DE TESTS / results
HARDNESS	34 - 40 HRC	40	38 - 40 HRC
TENSILE (KSI)	152 - 182 KSI		171 - 182 KSI

QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description
40	140	D2744 BLADE REF. 71856 1 PALETTE = 2 BC

COMMENTAIRES / comments

INSPECTEUR / inspector

DATE: 2011-10-05



METCOR INC.

560 BOUL. ARTHUR-SAUVÉ
ST-EUSTACHE, QC, J7R 5A8

Tel: 450-473-1884 / Fax: 450-491-5498

Certificat de Conformité Détaillé

Detailed Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
169674	1

CLIENT / customer 215

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K6A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K6A 1K7

1

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	CODE DE TRAITEMENT mat'i heat code	NUMÉRO DE LOT lot number						
14953		4130								
SPÉCIFICATIONS DU PROCÉDÉ processing specifications										
SEL HARDEN HARDEN AND TEMPER SAE AMS 2759/1 REV.E										
EXIGENCE / requirement	SPÉCIFICATIONS / specified		TESTS EXÉCUTÉS / performed	RÉSULTATS DE TESTS / results						
HARDNESS	34 - 40 HRC		40	38 - 40 HRC						
TENSILE (KSI)	152 - 182 KSI			171 - 182 KSI						
QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description								
40	140	D2741 BLADE REF. 71856 1 PALETTE = 2 BC								
Operation	Temp. spécifiée Specified Temp	Temps de tremp Spécifié Specified Soak Temp	Atmosphère	Carbone Carbon Potential	Q-Media Q-Temp	Four # Furnace #	Date Départ Start Date	Heure d'entrée Time In	Heure de sortie Time Out	Date Complétée Date complete
1,00 CONT. INIT.	LAVAGE		si nécessaire							
2,00 PREPARINC	COMPTAGE									
3,00 PREHEAT 1	1000	1:00 1:30	air			133				
4,00 SEL HARDE	1575	0:40	SEL		BRINE	106				
5,00 WASH	150	0:30	soap							
6,00 SNAP TEMF	400	2:00	air			609				
7,00 SANDBLAS			Sablage							



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO14953**

Purchase Order Date 9/20/2011

PO Print Date 9/20/2011

Page Number 1 of 1

Order From :

VC-MET004

METCOR INC.
560 BOUL. ARTHUR SAUVE
SAINT-EUSTACHE, QC J7R 5A8
CA

Contact Name

Vendor Phone

450 473 1884

Vendor Fax

450 491 5498

Vendor Account Nbr

Buyer

Brigitte Golden

Requisition Nbr

Tax Resale Nbr

10127-2607

Terms

Net 30

Currency

CAD

FOB

Destination-Collect

Ship To :

DART AEROSPACE LTD

1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Line Nbr	Reference Revision ID Vendor Part Number	Description/ Mfg ID	Req Date/ Taxable	Req Qty/ Unit of Measure	Ship Method	Unit Price	Extended Price
1	71856	D2741 Blade	9/26/2011 Yes	40.00	FedEx PI collect	\$10.3300	\$413.20

Special Inst:

Harden Material as per DWG: D2741
Ultimate Tensile Strength= 152ksi (34-40
HRC) Yield Tensile SDtrength=141 ksi.
Test report or Certification required

B 71856

PO Total:

\$413.20

Change Nbr: 1

Change Date: 9/20/2011

No substitution or deviation without
consent.
Certificate of Conformity or Material
Certification required when applicable

Disub 110 341

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ
ST-EUSTACHE, QC, J7R 5A8

Tel: 450-473-1884 / Fax: 450-491-5498

Certificat de Conformité Détaillé Detailed Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
169674	1

CLIENT / customer 215

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K6A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K6A 1K7

1

Operation	Temp. spécifiée Specified Temp	Temps de trempage Spécifié Specified Soak Temp	Atmosphère	Carbone Carbon Potential	Q-Media Q-Temp	Four # Furnace #	Date Départ Start Date	Heure d'entrée Time In	Heure de sortie Time Out	Date Complétée Date complete
8,00 DIST INSP										
9,00 TEMPER	875 +/-10°F	4 hrs	air			635				
10,00 HARDN INS										
11,00 SANDBLAS			Sablage							
12,00 HUILAGE			huile							
13,00 FINAL INSP							10-05-2011			10-05-2011

COMMENTAIRES / comments

ALL THE HEAT TREATMENT PROCESSING PERFORMED ON THIS ORDER WAS ACCOMPLISHED USING HEAT TREATMENT EQUIPMENT THAT MEETS THE REQUIREMENTS OF AMS 2750. ALL THE HEAT TREATMENT OPERATIONS WERE ACCOMPLISHED IN ACCORDANCE WITH THE REQUESTED/REQUIRED HEAT TREATMENT SPECIFICATION AND ALL REQUIRED VERIFICATIONS TEST HAVE BEEN PERFORMED AND DOCUMENTED. NO UNAUTHORIZED CHANGES OR DEVIATIONS TO REQUIRED HEAT TREATMENT SPECIFICATIONS OR PROCEDURES HAVE BEEN PERFORMED.

APPROUVÉ par / Approved by:

Vincent Gauthier

DATE: 2011-10-05

/ Nous certifions que toute l'information comprise sur ce rapport est exacte et conforme aux requis du client. / We certify that all the information on this report is exact and in accordance with the order requirements.